

Astrophysics

[AUSTRALIA TELESCOPE COMPACT ARRAY SURVEY FOR FORMALDEHYDE MASERS](#), [D. Halbe](#), E. D. Araya*, Physics Department, Western Illinois University, Macomb, IL 61455, ed-araya@wiu.edu

Massive stars are characterized by masses greater than 8 solar masses and are fundamentally important in astronomy given their role in synthesizing heavy elements like iron and calcium during supernova explosions, and the formation of extreme objects such as neutron stars and black holes. Massive stars form in dense cores within Giant Molecular Clouds. These molecular cores are rich in different molecular species, including organic molecules like formaldehyde, that can be identified by observations of absorption and emission lines. In regions where new stars form, the conditions of the gas can produce population inversion of molecular species, resulting in maser (microwave amplification by stimulated emission of radiation) lines that can be detected with radio telescopes. A maser transition from formaldehyde molecules at a wavelength of 6 cm (4.8 GHz) has proven to be quite intriguing: it is rare (has been found only toward 7 regions in our Galaxy) and traces very young massive stellar objects. Surveys for 6 cm formaldehyde masers have only been conducted in the northern hemisphere. Here we report preliminary results of a survey for formaldehyde masers in the southern hemisphere. The observations were done with the Australia Telescope Compact Array (ATCA). We have reduced the first two days of data and have already detected two new formaldehyde maser regions, increasing the number of known regions to nine. The new masers are found in regions without strong radio continuum, showing that the masers are tracing very young objects before large scale ionization by the massive protostars.

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